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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/750,164
Filing Date: December 31, 2003
Appellant(s): WRIGHT ET AL.

**MAILED
DEC 10 2007
GROUP 3700**

Susan D. Betcher
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed September 14, 2007 appealing from the Office action mailed December 5, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. The obviousness-type double patenting rejection is moot because a Terminal Disclaimer was filed on June 5, 2007 and has been approved.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 2002/0193685 A1	MATE et al.	12-2002
US 5,729,129	ACKER	3-1998

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4-7, 9-12 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mate et al. (US Patent App. 2002/0193685) alone. Mate discloses a system and method for accurately locating and tracking the position of a target within a body. The system uses a separate radiation delivery source 18, which is a linear accelerator, and an excitation source 32. There is a signal line between the controller computer 38 and the radiation delivery source at item 42. See Figure 1 and paragraphs 34-36. Paragraph 53 describes a method for removing data that has been corrupted by an excitation source. "In another embodiment, the system is operated in continuous wave (CW) mode where the excitation source 32 remains 'on' during measurement of the markers 30. The marker signal is 90 degrees 'out of phase' with the signal from the excitation source, so the marker signal is removed from the excitation signal." Broadly interpreted, this is describing filtering of relevant data from noise from an outside source. Regardless of whether the source is the actual excitation source or a

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therapeutic source, it would be obvious to one of skill in the art to remove erroneous data from a localization signal in order to localize the target correctly, especially when patient safety is a concern, such as minimizing collateral damage to healthy tissue surrounding the target (paragraph 35).

3. Claims 3, 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mate et al. in view of Acker'129 (US Patent No. 5,729,129). Mate discloses a system and method for accurately locating and tracking the position of a target within a body. However, Mate does not mention a matched filter for detecting interference. Acker'129 teaches the use of analog or digital band pass filtering and noise rejection devices to detect undesirable noise (column 5, lines 59-61). It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate an interference detector as taught by Acker'129 in the system of Mate to detect and eliminate unwanted noise.

(10) Response to Argument

Pages 5-9 of the Appeal Brief contain the Applicant's arguments regarding the failure of the Examiner to identify a sufficient reason why a person of ordinary skill in the art would find the claimed invention obvious over Mate, or Mate in combination with Acker.

As stated in the Office Action dated December 5, 2006, "Regardless of whether the source is the actual excitation source or a therapeutic source, it would be obvious to

one of skill in the art to remove erroneous data from a localization signal in order to localize the target correctly, especially when patient safety is a concern, such as minimizing collateral damage to healthy tissue surrounding the target (paragraph 35).” Paragraph 35 states, verbatim, “The system 10 allows the target 12 to be accurately positioned at the machine isocenter 22 so the ionizing radiation is accurately delivered to the target 12. The system also allows the target’s actual position relative to the machine isocenter 22 to be monitored during the radiation therapy so as to minimize collateral damage to the healthy tissue surrounding the target.” If the target, e.g. the marker, cannot be properly localized due to excessive noise (from whatever source), it will be impossible for the system to align the machine’s isocenter to minimize collateral damage to the healthy tissue surrounding the target. Mate recognizes this and confronts these issues in paragraphs 53 and 54.

The addition of Acker for claims 3, 8 and 13 teaches the use of signal processing devices such as analog or digital band pass filtering and noise rejection devices and signal averagers (column 5, lines 57-61). Firstly, while not explicitly disclosing the use of matched filters, Acker provides similar means that reject noise. It is obvious to one of skill in the art of noise rejection that in order for a filter to reject noise it must first detect the noise. Secondly, the current claimed invention detects the noise and then discards the data acquired while the noise is present. Therefore, the system disclosed by Acker provides the same end product as that disclosed in the current application.

Looking first at claim 1, Mate provides “A receiver [70 and 38 (of Figure 6)] that receives a plurality of inputs indicative of a sensed magnetic flux induced by a marker [30 (of Figure 1)], said marker excited by an excitation source [32 (of Figure 1)], said receiver comprising: a sensor [36 (of Figure 1)] configured to receive a plurality of inputs; a correlation processor [38 (of Figure 1)] for analyzing said plurality of inputs in a coherent manner and for generating a subset of the plurality of inputs by discarding corrupted inputs from the plurality of inputs, wherein inputs that are acquired when a therapeutic radiation source is active are considered corrupted.” Therefore, apparatus claim 1 provides a receiver with a sensor and a processor. The Applicant argues on page 11 that Mate is deficient in the underlined portion above. Paragraph 53 of Mate states, “The marker signal may be separated from the signal generated by the excitation source 32 via signal processing software or electronics in a number of ways. In one embodiment, the excitation source 32 is turned or gated ‘on’ to excite the marker and then turned or gated ‘off’ to allow for measurement of the marker response without interference by the signal from the excitation source. The marker 30 will continue to resonate after the excitation source 32 is gated ‘off’ for a period determined by the sensor’s electric inductance, capacitance and series resistance.”

Firstly, this passage in Mate discusses separating the marker signal from the *excitation* signal. For this reason the Examiner provides Mate as a Section 103 rejection. As stated previously, regardless of whether the source is the actual excitation source or a therapeutic source, it would be obvious to one of skill in the art to remove erroneous data from a localization signal in order to localize the target correctly,

especially when patient safety is a concern, such as minimizing collateral damage to healthy tissue surrounding the target (paragraph 35).

Regarding the same issue of excitation source versus therapeutic radiation source it is noted that the excitation source is a form of radiation. The system and method disclosed by Mate is therapeutic. Therefore, the Examiner interpreting a "therapeutic radiation source" broadly includes the excitation source as a therapeutic radiation source because without localizing the marker within the patient the therapy provided by Mate could not function properly. Therefore, the excitation source is an integral portion of the therapy process and can, and has been, interpreted as a therapeutic radiation source.

Secondly, a *correlation* processor is not explicitly stated within the Mate reference. Mate does disclose that signal processing software or *electronics* can be used to separate the marker signal from the excitation signal. Furthermore, Mate uses several sensors **36** within the sensor array **34**. The processor would obviously be required to correlate the data received by each individual sensor in a coherent manner in order to use this information to pinpoint the location of the marker within the patient.

Finally, Mate clearly provides for gating the excitation source on and off. When the excitation source is gated off it "allows for measurement of the marker response without the interference by the signal from the excitation source (paragraph 53)." This is considered to be a first input. When the excitation source is gated on it would obviously allow for measurement of the marker response with the interference by the signal from the excitation source. This is considered a second input. Either of these inputs

individually would comprise a subset of the whole, combined available measurements. However, "the marker signal may be separated from the signal generated by the excitation source 32 via processing software or electronics (paragraph 53)."

For at least these reasons, the Examiner respectfully believes that Mate teaches the limitations of claim 1.

Pages 13-14 represent similar arguments toward independent claim 11. For the same reasons regarding claim 1, the Examiner respectfully believes that Mate teaches the limitations of claim 11.

The Examiner notes that on page 14, the Applicant argues, "The claimed invention is directed toward the removal of data inputs in their entirety that are generated when a therapeutic radiation source is active (lines 25-27)." The Examiner respectfully disagrees with this statement. The plurality of inputs discussed in the independent claims can be interpreted as a signal portion and a noise portion. The generation of a subset of the plurality of inputs can be interpreted as filtering the signal out of the noise, wherein the noise is acquired when a therapeutic radiation source is active. This interpretation still reads on the independent claims and does not require removal of data inputs in their entirety. This interpretation is taught by Mate in paragraph 53 when it is stated, "In another embodiment, the system is operated in continuous wave (CW) mode where the excitation source 32 remains 'on' during measurement of the markers 30. The marker signal is 90 degrees 'out of phase' with

the signal from the excitation source, so the marker signal is removed from the excitation signal.”

Based on this interpretation, the Examiner believes that Mate teaches the limitations of Claims 1, 6 and 11.

On page 17, the Applicant argues that Mate does not teach 1) treatment on a human, 2) provide a “signal line” between the therapeutic radiation source and the receiver that carries a signal indicative of activity of the therapeutic radiation source, and 3) discloses a linear accelerator.

1) Regarding treatment on a human: Mate does not explicitly use the word human in the specification. However, the term patient is used in numerous occasions and Figure 1 clearly illustrates patient **16** as having a human a form. It does not take one of ordinary skill in the art to contemplate use of the Mate reference with a human subject.

2) Regarding the signal line:

i. With the interpretation of the excitation source representing a therapeutic radiation source see the line connecting **32** and **38** in Figure 1.

ii Assuming the therapeutic radiation source is created by Item **20** of Figure 1 and based on the statement of obviousness provided, it would be obvious to one of skill in the art that a signal indicative of a source gated “on” and/or “off” would be required in order to

perform the method taught in paragraph 53 of Mate. As claimed, this signal line can be a hard line or a wireless connection.

3) Regarding a linear accelerator, see paragraph 34.

Regarding Section 6(a) on page 18 of the Appeal Brief, see page 8 of the Examiner's Answer, which is a response to page 14 of the Appeal Brief.

Regarding Section 6(b) on page 18-19 of the Appeal Brief, see page 8 of the Examiner's Answer, which is a response to page 14 of the Appeal Brief. Also see page 5 of the Examiner's Answer.

Regarding Section 7 (Claims 7, 9 and 10) on page 19 of the Appeal Brief, see page 9 of the Examiner's Answer, which is a response to page 17 of the Appeal Brief.

Regarding Section 8(a) on page 20 of the Appeal Brief, see page 8 of the Examiner's Answer, which is a response to page 14 of the Appeal Brief.

Regarding Section 8(b) on page 20-21 of the Appeal Brief, see page 8 of the Examiner's Answer, which is a response to page 14 of the Appeal Brief. Also see page 5 of the Examiner's Answer.

Regarding Section 9 (Claims 12, 14 and 15) on page 21 of the Appeal Brief, see page 9 of the Examiner's Answer, which is a response to page 17 of the Appeal Brief.

On pages 21-22, the Applicant argues the rejection of claims 3, 8 and 13 based on the combination of Mate and Acker. The Applicant argues, "modifying the Acker invention with the filter of the claimed invention will render the Acker invention inoperable for its intended purpose. Specifically, Acker discloses and teaches an analog or digital band pass filter that is not equivalent to a matched filter. For example, the analog or digital band pass filter disclosed in Acker is an in-line filter designed to reject interference. The claimed matched filter is a separate off-line filter to detect interference." The Examiner notes that claim 3 (and similar claims) states, "further including a matched filter that is adapted to detect interference from said therapeutic radiation source." Furthermore, the passage in Acker reads as follows: *The amplification and ND conversion unit 30 may also include other conventional signal processing devices such as analog or digital band pass filtering and noise rejection devices and signal averagers.* As stated previously, it is obvious to one of skill in the art of noise rejection that in order for a filter to reject noise it must first detect the noise.

For at least these reasons, the Examiner believes that Mate in combination with Acker teaches the limitations of Claims 3,8 and 13.

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(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

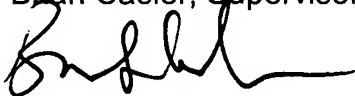
James Kish
Examiner

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November 13, 2007

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